



Love City Community Network

Company Profile & Prospectus
Love City Community Network Co.

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Who We Are

Love City Community Network (LCCN) was formed out of a volunteer effort in the immediate aftermath of Hurricane Irma to address a glaring unmet need for electronic communications on St. John. Our founding members, full-time residents with IT and Network Engineering skills, came together with massive community support to build a wireless network that could deliver critical communications for emergency first responders, relief organizations, and other critical infrastructures like pharmacies, gas stations, and grocery stores.

In early April 2018, LCCN was formally recognized as a 501(c)(3) nonprofit organization with a mission to develop, deploy, operate, and maintain internet and other communication systems for the community of St. John sustainable through hurricanes and other natural disasters.

LCCN and its users value reliable, resilient, and affordable internet access for communities in St. John. Commercial services remain delayed and do not provide sufficient access for much of our service area. LCCN supports the ongoing recovery for hundreds of local businesses and residents. We are proud to employ local Virgin Islanders who lost their jobs after Hurricanes Irma and Maria as Field Technicians who install service in homes and businesses and support connectivity in the areas of the island that remain underserved or unserved by commercial providers.

Strategic planning and practical goals of providing effective service, responsive support, and friendly engagement in our communities has elevated our network into a carrier-grade network system. LCCN is now positioned to scale up to a broader user base, support influx of tourism users, and supply the complex communications infrastructure needed by federal response partners. We are working to build the network as a model for disaster resilient communications using reasonably priced, rugged, and easily deployed gear as we scale the network and plan for a quick redeployment process by trained volunteers after the next storm.



Photo by Anne Bequette of STJ Creative Photography, LCCN user and supporter

Our Mission & Goals

Love City Community Network fully handles all aspects and operations of a modern, high-tech, highly available internet access network for the community of St. John sustainable through natural disasters, periods of recovery, and beyond. To this end, LCCN will fulfill its mission by supporting:

- I. Critical Infrastructure
Facilitate communication between and for emergency services, federal response partners, and non-government organizations.
- II. Free Public Hotspots
Activate neighborhood hotspots for public communication to allow for individuals to check in with loved ones, call for help, and organize immediate relief efforts.
- III. Economic Recovery
Using a tiered system, restore connectivity to businesses critical to the recovery such as the pharmacy, hardware store, and gas stations. Post emergency response phase; support economic recovery by connecting businesses so they can process credit cards, restock inventory, and accept reservations online.
- IV. Development of Resilient and Deployable Communication Systems
Provide stable and reliable internet and microcell communications to all communities on the island and develop technologies and processes to support the Islands of St. Thomas, St. Croix, and the greater Caribbean region.

Our Core Values

Love City Community Network's culture is driven by our commitments to:

- Serve the greater good
- Fair and equal treatment of our community and coworkers
- Efficient and ethical use of our resources, both human and fiscal

We are devoted to acting in the best interest of those whom we serve by supporting life-saving response, critical infrastructure, and economic development and resilience for the island of St. John, USVI.

Our Accomplishments

Love City Community Network, in its first year as an organization, has accomplished the following:

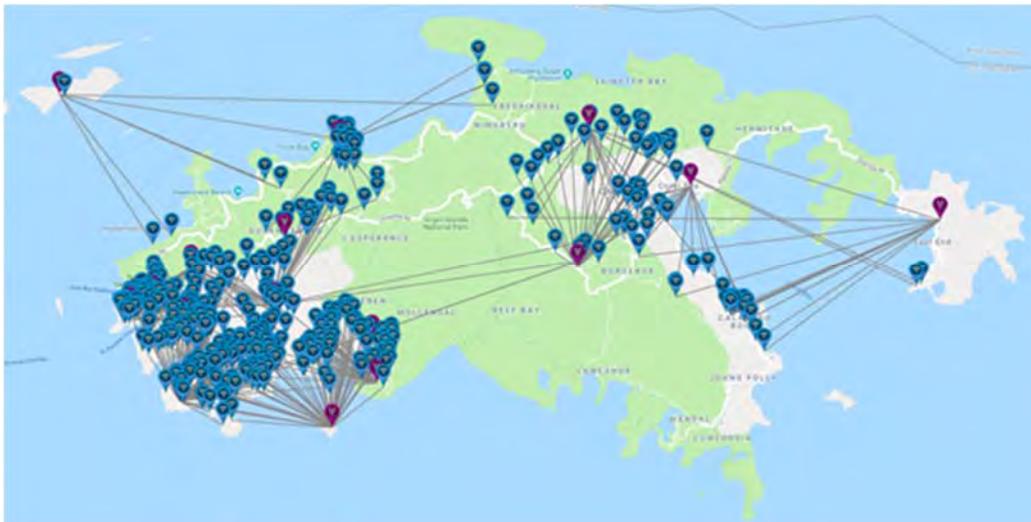
- Within four days of Irma, LCCN acquired a hardwired fiber optic feed and distributed it wirelessly to three public Wi-Fi hotspots located in Cruz Bay (“town”). These locations were:
 - The Boulon Center, near the **grocery store** and pizza parlor
 - The Bureau of Motor Vehicles parking lot, a large free parking lot near the **Cruz Bay fire station**
 - The National Park Visitors Center building, which was the initial coordinating site for all **federal agencies responding to St. John.**

The first two of these strategic locations allowed survivors to **connect with loved ones**, family, and friends to let them know they were safe. The third location was the initial federal coordinating center and staging area for most evacuations and processing of supplies being delivered via boat.

- Provided critical service to local businesses. Our tiered response plan prioritized businesses that are critical for jump-starting economic recovery. In the wake of weeks-long power outages and with traditional telecom and cellular service completely devastated, St. John was relegated to a cash-based economy. To make matters worse, the same nonfunctioning infrastructure needed to process credit cards is also used by ATM networks. Connecting the **hardware store, fuel stations, and lumber yard** immediately post-disaster allowed survivors of the storm to jumpstart their recovery efforts. Additionally, the island’s only pharmacy was cut off from its insurance and records database located on St. Thomas. Days after Hurricane Maria, **LCCN crossed Pillsbury Sound to connect the pharmacy**, which until that point had been unable to fill lifesaving prescriptions for its patients.
- The Coral Bay wireless distribution site, located at the far eastern end of St. John, was brought online just six weeks after Hurricane Irma made landfall. Located in the most remote area of the island, this community of fewer than 600 people was the last to be serviced by traditional utility companies, waiting at least 100 days for power restoration. Over one year later, the community is still underserved by traditional wireline internet service providers.
- Engineered and installed 17 wireless distribution sites strategically placed around the island that **distribute internet to over 500 homes and businesses**. The mountainous topography of St. John required the network architects to think beyond the typical “inside-out” methodology used by mainstream telecom companies to build their networks. This is in part why the restoration of traditional communications networks is still ongoing more than one year after the storms. LCCN’s distribution sites mainly skirt the outside of the island and broadcast in towards the communities they serve. Additionally, after a catastrophic event

many of our sites may be accessed by boat, **providing safer and easier access for service crews.**

- Four wireless distribution sites, including the main hub or Network Operations Center (NOC), have been designed to **run completely off the grid.** These sites utilize solar panels, power inverters, and batteries to store enough solar energy to run the signal distribution equipment as well as a public Wi-Fi hotspot.
- Each wireless distribution site has **battery backup power for an average of 48 hours.** This is important when operating a network in a region where, due to weak and overloaded infrastructure, extended power outages are routine. Additionally, when building a disaster resilient network, it's important to remember that St. John, being the smallest and least populated of the three US Virgin Islands, is often the last to receive aid and restoration resources. Our battery backup systems were designed to accommodate extended periods of limited charging capability due to cloud cover, which is often experienced in the days and weeks after a large storm.
- LCCN maintains 14 active public Wi-Fi hotspots strategically placed in communities around the island. These free hotspots enable members of a community to gain **connectivity at a location near their homes** rather than having to traverse dangerous roads to find Wi-Fi or cell signal. In the days after Hurricane Irma, survivors spent hours walking from their homes to Cruz Bay in hopes of being able to **communicate with loved ones.**



LCCN's network distribution map

Our Projects

Current & Ongoing Projects

I. Resilient Communication Systems

With limited resources, LCCN has built a commercial-grade wireless network on one of the most remote islands in America. Our team of IT professionals maintains an extensive infrastructure of wireless distribution sites consisting of radio antennas, network engineering equipment, and battery backup systems located in or on hardened **structures which survived both Hurricanes Irma and Maria**. The network spans St. John's 20 square miles and over 1,200 feet in elevation change from east to west and north to south. This coverage allows local EMS, federal partners, and private NGO responders to utilize Radio over IP (RoIP) and Voice over IP (VoIP) networks to communicate with each other, and the mainland ensuring the timely activation and coordination of resources such as medical helicopter evacuations and relief supplies. **The equipment we use is rated to withstand a Category 3 hurricane (125 mph winds) and is both simple and cost effective enough to be replaced and fully functional within 72 hours of an event.**

In the event of total destruction, LCCN's network is designed to be rebuilt and restored in a matter of days, not weeks or months. Approximately **80 businesses and 100 vacation villas rely on LCCN as their primary or backup connection** to accept lodging reservations, process credit cards, and reorder inventory. When Hurricane Irma struck, St. John became a cash-based economy overnight. Further exacerbating the problems were prolonged power outages, safety and logistical challenges that caused ATMs to be non-functional. A modern economy requires reliable online connectivity to banks, payment processors, and online business tools. Within days of Hurricane Irma, LCCN connected the only pharmacy on St. John to its headquarters location on St. Thomas so patients could refill prescriptions, which up until that point was unable to process prescriptions through insurance leaving patients to pay full price. The hardware store utilized LCCN to reorder construction supplies, coordinate shipping, and clear shipping containers through customs. **Without the timely delivery of supplies to rebuild, economies become stagnant and communities suffer.**

II. Free Public Emergency Hotspots

For weeks following Hurricane Irma, survivors from all areas of the island traveled to Cruz Bay to reach the one area on the island that had spotty cellular service and limited internet connectivity at best. In some cases, survivors spent their entire day traveling to Cruz Bay to reach out to EMS, loved ones, insurance companies, etc. Since the hurricanes, **LCCN has placed 14 active free public Wi-Fi hotspots in strategic neighborhoods** around the island enabling

survivors to safely communicate with EMS, loved ones, doctors, insurance companies, and other outlets needed in the aftermath of a natural disaster.

Along with hotspots being strategically positioned, several are off grid with the remaining units connected to backup generator systems. **With continued funding, all hotspots will be off grid using compact solar and battery systems** to broadcast the network without relying on the Virgin Islands Water and Power Authority (WAPA) to restore grid power (an effort that took 51 days after Hurricane Irma to reconnect only a small portion of Cruz Bay). Portions of Coral Bay weren't restored for over 100 days.

Technological advancements are making the first generation of the LCCN emergency hotspots scalable to the point of being able to co-locate on utility poles.



LCCN mobile hotspot distributed free public Wi-Fi in Franklin Powel Park during the Praise and Thanksgiving event (Sept. 2018)

III. Off-Grid Power Solutions

Using simple and state of the art equipment and technology, currently all LCCN's wireless distribution sites have battery backup for an average of 36 hours. While four of our sites are 100% off the grid, **we are working towards total energy independence** for the remaining 13 sites. This is extremely important for the resiliency of the network so that in the event of a prolonged power outage the network stays active.

As mentioned above, after Hurricanes Irma and Maria, it took 51 days to receive power for only a small portion of Cruz Bay. Areas more remote, such as Coral Bay, at the easternmost part of the island, took a minimum of 100 days to be reconnected to grid power. It is also not uncommon for the power infrastructure to fail on a regular basis due to loss of generating capacity at the power plant on St. Thomas. These power outages can last anywhere from 20 minutes to multiple days, depending on the nature of the precipitating incident. **Outages affect local commercial Internet Service Providers (ISPs), as well as local cell towers, leaving St. John largely disconnected from emergency services.** With off-grid power systems, we are able to keep our network up and running. Clients with backup power at their residence or business can continue to use the service to take advantage of Wi-Fi calling and process credit cards for the duration of the power outage.

Upcoming Projects

I. Equitable Access

We live in an era where internet connectivity is no longer a luxury. Having even the most basic connectivity to the outside world means that families can keep in contact, children have access to educational resources, and with the adaptation of telemedicine, patients can speak to their medical professionals face-to-face.

Equitable access to telecommunications infrastructure has been a pervasive challenge on St. John. Due to the mountainous terrain on the island, many small rural communities are tucked away on steep hillsides or in valleys where there is no cellular coverage and the cost of installation prohibits traditional wireline infrastructure. LCCN has developed the expertise required to provide service to these underserved communities.

At the heart of the Equitable Access project is a privately-owned parcel in the Concordia area located at the southeastern most tip of St. John. LCCN has gained permission from the property owner to install a carbon fiber pole that will host the equipment needed to connect our Kismet and Hansen Bay distribution antennas.

The strategic addition of the Concordia distribution site allows LCCN to serve the communities of Lameshure, Mandal, and John's Folly, as well as connect the University of the Virgin Islands operated Virgin Islands Environmental Resource Station (VIERS). VIERS, a legacy of NASA's early space exploration days, now serves as a renowned research site for environmental education and scientific research.

II. Layer 3

When faced with something as simple as an influx of tourists from a cruise ship or as complex as a natural disaster with multiple federal and NGO responders demanding unique connectivity needs, **the LCCN network will be operational and ready to handle an increase in traffic.**

The LCCN network has multiple layers of data that flow through the distribution links. Implementation of Layer 3 protocols is an industry best practice that organizes these layers of traffic into more efficient and direct routes. This prevents congestion and overloading of equipment that results in slow speeds and frequent equipment crashes.

Layer 3 is similar to installing noise canceling headphones at each of our distribution sites. Instead of our equipment working overtime to "hear" a message in a crowded room, Layer 3 organizes traffic and "turns down" erroneous traffic

meant for other sites. This highly engineered process happens in the background with the only effect on the end user being a **faster and more reliable network**.

The key to a successful transition and deployment to a Layer 3 network is continuing education and subject matter experts who are versed in the complexities of operating a large and diverse communication network in austere environments.

Long-Term Projects - still in the planning and development stage

I. Interoperability, Alternative Backhaul and Diversification of Broadcast Signal

With a robust infrastructure already in place, LCCN is exploring alternative means to broadcast signal to a diverse set of users.

During response, a network with interoperability is essential to ensure federal agencies are able to communicate with each other over secure channels. Police and fire departments operate on a separate layer that must be integrated with the federal response partners. NGOs also play a critical part in response by performing roll calls that assist local and federal response partners in prioritizing response assets. With technological upgrades and the installation of a **Public Service Answering Point**, the LCCN network will be positioned to handle all three layers of response communications.

The strategic placement of the network distribution sites allows visual line of site for secondary and tertiary backhaul supply from various points on St. Thomas and even St. Croix. In the event the underwater fiber cables that supply all of St. John's communications are severed, LCCN will be able to immediately transition to another service provider ensuring almost zero downtime in connectivity. The alternate types of backhaul supply include a standard wireless connection to Crown Mountain, St. Thomas, microwave link to St. Croix, and a permanent satellite installation on St. John capable of being upscaled to handle full network traffic.

In addition to multiple backhaul providers, LCCN will be able to use its network distribution sites to broadcast a diverse range of signal including **cellular LTE, Long Range Radio frequencies, and Bluetooth.**

II. Workforce Development

A community-oriented organization at its heart, LCCN has written education and workforce development into its corporate charter. With tourism being the primary economic driver on St. John and every major resort severely damaged or destroyed, survivors were dealt a double blow, losing their homes and their livelihoods.

Topics for education and workforce development include but are not limited to internet, satellite, and cellular communications systems; network engineering and business management; and off-grid power systems. Targeted recipients of education hours may include, but are not limited to, school-aged pupils, college students, adult learners, and persons transitioning into the field of information technology and communication systems.

III. Regional & National Deployable Communications Systems

Using lessons learned from the initial build-out of the network and continued maintenance during the recovery phase, LCCN has developed a rapidly deployable communication system that can be pre-positioned or installed immediately following any catastrophic event. The challenging topography of St. John has led to a variety of out-of-the-box solutions to problems. It is important to keep the network operating and not put on cold standby waiting for the next natural disaster. Many issues arise daily that can be mitigated by keeping the network running 24/7, 365 days a year, such as trees obstructing lines of sight, equipment failures, and more.

IV. Generation II Micro Hotspots

Technological advancements are making the first generation of the LCCN emergency hotspots scalable to the point of being able to collocate on utility poles by utilizing micro-sized access points and the existing charging and battery storage located inside the street light. Development of this technology will result in public emergency hotspots that can fit inside of a shoebox as opposed to large storage crates weighing over 50 pounds



LCCN redundant backbone networking showing mountainous terrain

Our Team

I. Administration

Devin Murphy, Executive Director – dmurphy@lccn.vi

The Director provides leadership and vision for the organization and oversees the Operations Staff. Working under advisement from the Board of Directors, Devin's responsibility is to oversee network operations and engineering, donor development, marketing, and manage projects and grants in order to fulfill the mission of LCCN. His experience includes project management across multiple industries and 11 years managing a federal Disaster Medical Assistance Team for the National Disaster Medical System.

Sarah Hanson, Project Administrator – sjhanson@lccn.vi

The Project Administrator supports all operating divisions of LCCN, including answering the first tier technical questions, and assists with scheduling field technicians, marketing, event planning, and aspects of donation management. Sarah manages the LCCN office and assists the Executive Director with small and large projects. While only having permanently moved to the island two and a half years ago, Sarah has spent the past 18 years traveling annually to St. John with her family, which has allowed her to connect with many local clients and donors.

II. Operations

Matthew Gyuraki, Director of Operations – matt@lccn.vi

Matt is responsible for managing the day-to-day maintenance and improvement of LCCN's physical network infrastructure. Providing leadership to the field staff, Matt ensures project timelines are met and recommends capital improvement projects to ensure the network operates reliably and is resilient. Using his degree in computer science, Matt has primarily worked in the IT field since moving to St. John permanently in 2009.

Morgan Barlas, Network Engineer – morgan@lccn.vi

Responsible for managing the "behind the scenes" aspects of the LCCN network, Morgan oversees the core network and network management systems to ensure user traffic is routed properly and efficiently. Additionally, the Network Engineer manages all LCCN data systems and interfaces with our outside technology vendors. Having lived on St. John since the age of seven, Morgan holds a degree in mechanical engineering and has over 20 years' experience managing network infrastructure across a range of industries including multiple Fortune 500 companies.

Dylan Jobsis, Power and Solar Systems Supervisor – djobsis@lccn.vi

As Power and Solar Systems Supervisor, Dylan is responsible for the design and buildout of solar charged battery backup systems, knowing the latest technologies in the solar and power realm, and using creative solutions to solve complex power supply problems presented by our island's remote location. Dylan is responsible for ensuring all distribution sites remain online in the event of routine and extended power outages. A resident of the Virgin Islands since 2001, Dylan graduated from the University of the Virgin Islands with a degree in Biology.

III. Technicians and Support Staff

Field Technicians

Under the direction of the Chief Technician, the field technicians support the maintenance of network distribution sites, new client installations, and answer technical support calls. Our Chief Technician, Pete Mottl, has a degree in computer science, over 10 years of executive-level management experience, and has lived on St. John since 2016.

Other Support staff includes our part-time bookkeepers Kortney Hogan who supports the financial operations of many businesses critical to St. John's response and recovery efforts and Megan Kenobbie who offers expertise on various matters after serving as a Corporate Controller at Enterprise Rent-A-Car.



Our Board

The Love City Community Network's Board of Directors embodies a team of individuals that support and guide the LCCN team in their mission to provide post-disaster connectivity to vulnerable communities on the island of St. John, USVI.

Nick Harland, Senior Manager - Microsoft

Nick's diverse background in technology has brought him from network engineer at Cisco through the ranks at Microsoft into his current position, Senior Manager of Cloud Infrastructure Geospatial Intelligence. In this role he manages a team that develops tools and analytical methods to enable decision making for Microsoft's cloud infrastructure investments. His network engineering experience in remote and disaster-stricken communities was critical to the early development of Love City Community Network. Nick has had a lifelong connection to the island of St. John through family and has been an enthusiastic supporter of LCCN's mission from day one.

Ian Samuel, Bloomberg Response Team

Ian, a native resident of St. John, is a longtime supporter of many nonprofit organizations on the island, with a particular focus on youth development. Since Hurricanes Irma and Maria, Ian has served as Bloomberg Philanthropies local liaison. He also sits on the board of the St. John Community Foundation and Love City Strong as well as the advisory board for the St. John Long Term Recovery Group.

Celia Kalousek, Executive Director - St. John Community Foundation

Celia moved to St. John in 2001 from Atlanta, Georgia, where she owned and operated an advertising agency for 13 years, served on various nonprofit boards, and was director of a senior services agency. Since then she has been heavily involved in all aspects of community service on St. John, which she used as material for her master's thesis at UVI. Celia was hired by St. John Community Foundation (SJCF) in 2010 under a Capacity Building grant, stepped into the role of Director in 2011, and looks forward to celebrating the 30th Anniversary of SJCF in 2019! She is honored to help facilitate the Long-Term Hurricane Recovery and Resiliency Team and remains passionate about the SJCF's mission of providing services and supporting programs that positively engage people, build resources, and strengthen the St. John community now and for future generations.

Strategic Partnerships

Viya

LCCN is proud of our partnership with Viya, the local telecom company for the Virgin Islands. Viya has provided voice, cable, data, and enterprise solutions to the USVI for decades and employs local St. John residents who in the initial response post-Hurricane Irma, were directed by senior management to use Viya time and resources to assist residents and response partners in initial storm cleanup efforts.

University of the Virgin Islands

Partnering with the Water Resources Research Institute, LCCN is providing the infrastructure and connectivity for NOAA rated weather stations that provide new methodologies for real-time microclimate monitoring, which will improve real-time weather forecasting in the territory; the exploration of physical and biological indicators of riparian health to provide conservation guidance for the territory's gut habitats; and the Water Ambassadors Program, an educational outreach program targeting local junior high schools



Photo of St. John by Steve Simonsen, an LCCN user and supporter

How You Can Help

Communications are essential. This has never been made clearer than in the aftermath of the devastating hurricane season of 2017. On the island of St. John, urgent calls for help from survivors went unanswered, and first responders were unable to receive basic directions and information vital to their rescue efforts. Those watching from afar were unable to receive any information on the wellbeing of their loved ones or the status of the island's critical infrastructure. **Love City Community Network wants to make sure this never happens again.**

When the next disaster hits St. John, LCCN is prepared to deploy a trained team with specialized equipment and training to restore communications to response officials, businesses, and residents in need. Our engineers have built redundancies into the network for superior reliability to the ongoing support of our many generous donors.

Your donations can guarantee the island of St. John has connectivity now and for the future. While monetary donations may not feel tangible, they allow us to purchase the items that we need to ensure that St. John stays connected.

\$50 – Fill up one of our field technicians' vehicles with gas. Currently our technicians are using their personal vehicles to traverse the island and install business/homes with the internet as well as provide on-site technical support as issues are reported from our clients

\$150 – Provide a full day of work for one of our field technicians. All our field technicians are local Virgin Islanders who lost their jobs following Hurricanes Irma and Maria and now make their livelihood by helping the local community get and stay reconnected

\$250 – Connect a low income/disadvantaged community member. This amount covers the cost of the devices needed to get connected along with the installation costs

\$1,000 – Fund a small solar power system that will power a Wi-Fi hotspot that will be deployed immediately following another disaster

\$5,000 – Solarize one network distribution site to be 100% off grid. This amount will purchase the solar panels, batteries, and all other necessary equipment to invert the solar energy, as well as monitor the capacity and performance of the equipment

\$25,000 – Upgrade critical distribution radios and purchase disaster replacement equipment

\$50,000 – Fund research and development of deployable communications systems for sister islands in the Virgin Islands, wider Caribbean and US Mainland disaster areas

\$100,000 – Fund construction of the Concordia wireless distribution site to provide equitable access to areas unserved by traditional telecom companies, redundant link to Coral Bay, potential to send/receive signal to Tortola, BVI, and offers a future site for a commercial grade satellite uplink